## PATENT ABSTRACTS OF JAPAN

(11)Publication number:

64-024447

(43)Date of publication of application: 26.01.1989

(51)Int.CI.

H01L 23/36 H01L 23/46

(21)Application number: 62-180669

(71)Applicant: HITACHI LTD

(22)Date of filing:

20.07.1987

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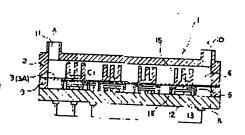
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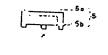
## (54) SEMICONDUCTOR COOLER

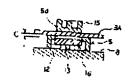
## (57)Abstract:

PURPOSE: To avoid any defective connection of a solder ball for enhancing the reliability thereof by a method wherein the elasticity and the water pressure of a cooling member are felt by a wiring substrate not to be applied on a semiconductor chip or a package.

CONSTITUTION: A spacer 5 is composed of, e.g.) a square flat part 5a bonded onto the lower surface of a diaphragm 3A formed of a heat conductive material and multiple, e.g., three each of holding members 5b erectly formed downward around the flat part 5a. The holding members 5b are pressed against a wiring substrate 8 by the elasticity of the diaphragm 3A and the water pressure of cooling water running in a cooling water channel 6. Besides, specified gap C is set up to be







formed between the lower surface of the flat part 5a and the upper surface of the flat part 5A by the spacer 5. This specified gap C is filled with grease 16 as, e.g., a soft conductive material. In such a constitution, the spacer 5 is pressed against the wiring substrate 8 by the pressure of cooling water running in the cooling water channel 6 of a water cooling jacket 2 and the elasticity of the diaphragm 3A.